

## On the Spiracles of Coleoptera and on the Sound Produced by Polyphylla.

On 10 July 1874 I observed a male *Polyphylla variolosa* (Hentz) making a creaking noise while moving its abdomen up and down under the elytra. Examination of the specimen shows upon the outer face of the spiracle-bearing plate of the metathorax an oblong, slightly swollen area, free from pubescence, of a thin texture and pale color. This is covered by the elytra when the insect is at rest. At a corresponding point under the margin of the elytra is seen an area of similar size and of a pink color. The same structure is to be seen in the female *Polyphylla*, but what relation, if any, this has to the production of the sound it is difficult to understand.

The existence of mesothoracic and metathoracic spiracles in coleoptera has recently (*Amer. Nat.*, 1874, p. 532) been questioned, because of the absence of such spiracles in the larva. None are apparent upon the mesothorax of *Polyphylla*, but a more careful examination will discover that they are present here, since Strauss-Durckheim found them in *Melolontha* and Reinhard asserts their existence in the hymenoptera, notwithstanding that they are not externally visible. The metathoracic spiracles, however, are very obvious in *Polyphylla*, being placed at the inner margin of the membrane which forms part of the dorsal face of that plate which on its vertical face presents the structure noticed above. Behind these spiracles are situated seven additional pairs, a pair upon each segment of the abdomen excepting the last. The spiracles of the prothorax and of the basal segment of the abdomen are larger than the others, although, being concealed in the sutures, they are to be found only by dissection. In *Tenebrio*, and many other coleoptera, it is true, no metathoracic spiracles are apparent.

Dr. Packard states (l. c.) that in the coleoptera there are usually *eight* pairs of abdominal spiracles. This is manifestly incorrect in regard to the imago, for *in no adult hexapod insect* can more than *seven* pairs of abdominal spiracles be demonstrated. In larvae eight pairs is the maximum, but *functionally* the eighth pair belongs to the seventh segment and the first

pair to the metathorax, and in changing to the imago each pair of spiracles is transferred to that segment to which it functionally belonged in the larva. The typical number of spiracles in insects is ten pairs, and none are ever present in excess of this number, or which are not homologous with some of these.

In Mr. Gissler's article in *PSYCHE*, vol. 2, p. 240, it is stated that the adult *Amblychila* has seven pairs of stigmata." Desiring to find what had become of the missing spiracles of the larva, I examined some specimens collected in Kansas and kindly presented by Mr. S. W. Williston, of New Haven. Without attempting to find the minute mesothoracic pair, which are not present in the larva, the prothoracic pair and seven abdominal pairs were easily discovered, making *eight* in all. The metathorax of *Amblychila* is very much reduced dorsally, the wings are absent, and no spiracles are apparent on this segment. The pair under the posterior edge of the prothorax are, as usual, very large. The spiracles of the abdomen diminish in size to the last, which are nevertheless well developed.

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## BIBLIOGRAPHICAL RECORD.

(Continued from page 267.)

The date of publication, here given in brackets [ ], marks the time at which the work was received by the Editor, unless an earlier date of publication is known to him. An asterisk \* before a title is the Recorder's certificate of accuracy of quotation. Corrections of errors and notices of omissions are solicited. — B: PICKMAN MANN.

Nos. 1215 to 1255 are from *Can. entom.* 1877, v. 9.

\* 1252. **Westcott**, Oliver S. Food plants of *H. maia*. (*Can. entom.*, 1877, v. 9, p. 220.)

[See Rec., no. 1191.] *Hemileuca maia* abundant in swampy localities. Does it not feed on other plants besides *Quercus*, *Salix* and *Spiraea*? [Dec., 1877.]

\* 1253. **Peck**, G: Williams. [Captures of rare lepidoptera.] (*Can. entom.*, 1877, v. 9, p. 220.)

♂ species of *Catocala* and larvae of 4 species of *Sphingidae* captured in Roselle, N. J. [Dec., 1877.]

\* 1254. **Grote**, A: Radcliffe. [A "seeming growth."] (*Can. entom.*, 1877, v. 9, p. 220.)

[See Rec., no. 1241.] Suggests that the "growth" referred to is a pollenmass. [Dec., 1877.]